

REMARKS

Claims 1 and 3 through 30 are in the application, with Claims 7 through 9 and 16 through 26 having been withdrawn from further consideration. Claims 1, 3 through 6, 10 through 15 and 27 through 30 are therefore currently under consideration. Claims 1, 6, 11, 27, 29 and 30 have been amended, and Claims 1, 11 and 27 are the independent claims currently under consideration. No new matter has been added. Reconsideration and further examination are respectfully requested.

Claims 1, 3 through 6 and 10 through 15 are rejected under 35 U.S.C. §103 over U.S. Patent Application Publication No. 2002/0004251 (“Roberts”) in combination with U.S. Patent No. 5,919,329 (“Banks”); Claims 27 through 30 are rejected under 35 U.S.C. §103 over Roberts in combination with Banks and U.S. Patent No. 6,494,371 (“Rekow”); Claims 1, 3 and 11 through 14 are rejected under 35 U.S.C. §103 over U.S. Patent No. 6,949,771 (“Yoganandan”); and Claims 27 through 30 are rejected under 35 U.S.C. §103 over Yoganandan in combination with Rekow. Reconsideration and withdrawal of these rejections are respectfully requested.

Claim 1

Amended independent Claim 1 relates to a device including a semiconductor substrate, a pixel cell array integrated with the semiconductor substrate, a liquid crystal layer in contact with the pixel cell array, a substantially transparent protective cover coupled to the liquid crystal layer, and a base coupled to the semiconductor substrate. Thermal expansion characteristics of the base are substantially similar to thermal expansion characteristics of the protective cover. Some embodiments of the foregoing may provide thermal protection to a pixelated liquid crystal-based display.

The art of record is not seen to disclose or to suggest the foregoing features of amended Claim 1. For example, the art of record does not disclose or suggest at least the claimed substrate, pixel cell array, liquid crystal layer, protective cover, and base, wherein thermal expansion characteristics of the base are substantially similar to thermal expansion characteristics of the protective cover.

Roberts describes a package for a light-emitting diode (LED) and a method of making the package. The package includes substrate 501, a single optical radiation emitter 202, wirebond 211 to couple emitter 202 to electrical lead 210, optic 401 and metal coating 603. Roberts does not describe any liquid crystal layer such as claims in Claim 1. The outstanding Office Action cites wirebond 211 as suggesting the “light switching layer” of previously-submitted Claim 1. Even if such a citation is correct, which is not conceded, one of ordinary skill in the art could not reasonably interpret the term “liquid crystal layer” to encompass wirebond 211 of Roberts. See M.P.E.P. §2111.01.

Banks is not seen to remedy the foregoing deficiencies in Roberts. Banks describes package 512 and lid 532 having approximately matching coefficients of thermal expansion (CTEs). However, Banks is not seen to provide any suggestion or motivation to match the CTEs of a metal undercoating such as coating 603 of Roberts with an optic such as optic 401. Moreover, Banks is not seen to disclose or to suggest any light switching layer.

Yoganandan also is not seen to disclose or to suggest the foregoing features of Claim 1. Yoganandan describes LED-based package 200 for mounting on a circuit board. Package 200 includes LED die 230, wires 240 and 242 coupled to die 230 and encapsulant 260 upon substrate 210. As described with respect to Roberts, wires 240 and 242 cannot reasonably be seen to disclose or to suggest a liquid crystal layer.

Accordingly, none of the art of record is seen to disclose or suggest at least the claimed substrate, pixel cell array, liquid crystal layer, protective cover, and base of Claim 1, wherein thermal expansion characteristics of the base are substantially similar to thermal expansion characteristics of the protective cover. Amended independent Claim 1 and its dependent claims are therefore believed to be in condition for allowance. In this regard, the art of record is also not seen to disclose or to suggest an electrode disposed between a liquid crystal layer and a protective cover as claimed in Claim 29.

Claim 11

Amended independent Claim 11 relates to a system including a microdisplay IC and a chip carrier. The microdisplay IC includes a semiconductor substrate, a pixel cell array

integrated with the semiconductor substrate, a liquid crystal layer in contact with the pixel cell array and a substantially transparent protective cover coupled to the liquid crystal layer. The chip carrier defines a recess, and the microdisplay IC is mounted within the recess.

The art of record is not seen to disclose or to suggest the foregoing features of amended Claim 11, particularly with respect to the claimed substrate, pixel cell array, liquid crystal layer, protective cover, and base, which comprise a microdisplay IC mounted in the recess of a chip carrier.

In particular, Roberts is not seen to disclose or to suggest at least the claimed liquid crystal layer of the claimed microdisplay IC. Banks is not seen to contain any disclosure to remedy this deficiency in Roberts. Yoganandan also is not seen to disclose or to suggest at least the claimed liquid crystal layer of the microdisplay IC. Again, wires 240 and 242 cannot reasonably be seen to disclose or to suggest a liquid crystal layer.

Amended independent Claim 11 and its dependent claims are therefore believed to be in condition for allowance. With respect to dependent Claim 30, the art of record is also not seen to disclose or to suggest an electrode disposed between a liquid crystal layer and a protective cover.

Claim 27

Amended independent Claim 27 relates to a system including an Ultra High Pressure light source to emit light, a condenser lens to condense the light, a display device to receive the condensed light and to emit image light, and a projector lens to project the image light. The display device includes a semiconductor substrate, a pixel cell array integrated with the semiconductor substrate, a liquid crystal layer in contact with the pixel cell array, a substantially transparent protective cover coupled to the liquid crystal layer, and a base coupled to the semiconductor substrate, thermal expansion characteristics of the base being substantially similar to thermal expansion characteristics of the protective cover.

The art of record is not seen to disclose or to suggest the foregoing features of amended Claim 27. Specifically, the art of record does not disclose or suggest at least the claimed substrate, pixel cell array, liquid crystal layer, protective cover, and base, wherein thermal

expansion characteristics of the base are substantially similar to thermal expansion characteristics of the protective cover.

The LED package of Roberts cannot be seen to disclose or to suggest at least a pixel cell array integrated with a semiconductor substrate, a liquid crystal layer in contact with the pixel cell array, and a substantially transparent protective cover coupled to the liquid crystal layer. Banks does not, as mentioned above, describe or otherwise suggest a base coupled to a semiconductor substrate and a substantially transparent protective cover coupled to a liquid crystal layer in contact with a pixel cell array integrated with the semiconductor substrate. Banks also does not disclose or suggest that thermal expansion characteristics of such a base may be substantially similar to thermal expansion characteristics of such a protective cover.

Yoganandan also is not seen to disclose or to suggest at least a liquid crystal layer as claimed in Claim 27. For example, wires 240 and 242 cannot reasonably be seen to disclose or to suggest a liquid crystal layer and therefore encapsulant 260 does not suggest a substantially transparent protective cover coupled to a liquid crystal layer.

Rekow describes a laser light projector to illuminate light modulators. Rekow has not been cited as containing, and is not seen to contain, any disclosure to make up for the foregoing deficiencies in either outstanding rejection of Claim 27. Specifically, Rekow is not seen to disclose or to suggest a base coupled to a semiconductor substrate and a substantially transparent protective cover coupled to a liquid crystal layer in contact with a pixel cell array integrated with the semiconductor substrate, wherein thermal expansion characteristics of such a base may be substantially similar to thermal expansion characteristics of such a protective cover.

Amended independent Claim 27 and its dependent claims are therefore believed to be in condition for allowance.

CONCLUSION

The outstanding Office Action presents a number of characterizations regarding each of the applied references, some of which are not directly addressed herein because they are not related to the rejections of the independent claims. Applicant does not necessarily agree with the characterizations and reserve the right to further discuss those characterizations.

For at least the reasons given above, it is submitted that the entire application is in condition for allowance and such action is respectfully requested at the Examiner's earliest convenience. Alternatively, if there remains any question regarding the present application or any of the cited references, or if the Examiner has any further suggestions for expediting allowance of the present application, the Examiner is cordially requested to contact the undersigned via telephone at (203) 972-0049.

Respectfully submitted,



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Date

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